OPEN ACCESS Freely available online

ISSN: 1948-5948
Journal of Microbial & Biochemical Technology

Commentary

The Advantages of Microbial Cellulose over Plant-Derived Cellulose

Daniel Pelling*

Department of Biology, University of Ottawa, Ontario, Canada

DESCRIPTION

Cellulose is a natural polymer that is commonly found in plants, bacteria, and other microorganisms. It is an important industrial material, used in a wide range of applications such as paper, textiles, and biofuels. One of the most promising sources of cellulose is bacteria, which can produce a unique form of cellulose known as microbial cellulose. Microbial cellulose has several advantages over plant-derived cellulose, including higher purity and greater mechanical strength. It also has potential applications in biomedical engineering, as it is biocompatible and can be used to create scaffolds for tissue engineering and wound healing. Bacteria that produce microbial cellulose are found in a variety of environments, including soil, water, and the gastrointestinal tracts of animals. One potential source of these bacteria is rotten fruit, which is often teeming with microorganisms. To isolate bacteria that produce microbial cellulose from rotten fruit, a series of steps must be followed. First, a sample of the fruit is collected and sterilized to remove any surface contaminants. The fruit is then macerated and added to a growth medium that is designed to promote the growth of cellulose-producing bacteria. After incubating the growth medium for several days; colonies of bacteria should begin to appear. These colonies can be screened for cellulose production using a variety of methods, such as staining with Congo red or calcofluor white. Positive colonies can then be further characterized using techniques such as 16S rRNA sequencing to identify the bacterial species present. Once a cellulose-producing bacterial strain has been isolated and identified, it can be used to produce microbial cellulose on a larger scale. This typically involves growing the bacteria in a nutrient-rich medium under controlled conditions, such as temperature, pH, and the oxygen concentration. During the growth process, the bacteria secrete cellulose into the surrounding medium, which forms a gel-like matrix that can be harvested and purified. The resulting microbial cellulose can then be used in a wide range of applications, including food and cosmetics, as well as in biomedical engineering. One example of a bacterial strain that produces high-quality microbial cellulose is *Gluconacetobacter xylenes*. This bacterium is commonly found in kombucha tea, a fermented beverage made from sweetened tea and a symbiotic culture of bacteria and yeast. *Gluconacetobacter xylenes* produce a highly pure form of cellulose, with minimal contamination from other proteins or sugars. It also has a high mechanical strength, making it suitable for use in applications such as wound healing and tissue engineering. Another potential source of cellulose-producing bacteria is the fruit of the nata de coco palm. Nata de coco is a traditional Filipino dessert made from the fermentation of coconut water with *Acetobacter xylinum*, a bacterium that produces microbial cellulose. The nata de coco fermentation process involves inoculating coconut water with *Acetobacter xylinum* and allowing it to ferment for several weeks. During this time, the bacteria produce a large quantity of microbial cellulose, which forms a gel-like substance that is harvested and processed into nata de coco. While the production of microbial cellulose from bacteria isolated from rotten fruit is a promising field; there are still many challenges that must be overcome. One of the major challenges is the cost of production, as the growth medium and other materials can be expensive. There are also concerns about the safety and purity of the resulting microbial cellulose, as it can be contaminated with other microorganisms or toxins. To address these issues, researchers are developing new methods for producing microbial cellulose that are more cost-effective and reliable, while also ensuring the safety and quality of the final product.

Correspondence to: Daniel Pelling, Department of Biology, University of Ottawa, Ontario, Canada, E-mail: Danielelling@gmail.com

Received: 03-Apr-2023, Manuscript No. JMBT-23-21299; **Editor assigned:** 07-Apr-2023, Pre QC No. JMBT-23-21299 (PQ); **Reviewed:** 21-Apr-2023, QC No. JMBT-23-21299; **Revised:** 28-Apr-2023, Manuscript No. JMBT-23-21299 (R); **Published:** 05-May-2023, DOI: 10.35248/1948-5948.23.15:557

Citation: Pelling D (2023) The Advantages of Microbial Cellulose over Plant-Derived Cellulose. J Microb Biochem Technol. 15:557.